

Listing of Claims:

1. (Currently Amended) A power system to provide power between a DC device and at least one of a primary alternating current AC device and a secondary alternating current AC device, the power system comprising:

a bi-directional power converter comprising a set of alternating current AC terminals, a set of DC terminals, and a number of bridge legs electrically couplable between the set of AC terminals and the set of DC terminals, at least some of the bridge legs selectively operable to invert a current when the current is flowing from the set of DC terminals to the set of AC terminals and to rectify the current when the current is flowing from the set of AC terminals to the set of DC terminals; and

a first switch operable to selectively electrically couple and uncouple the secondary AC device respectively to and from the set of AC terminals of the bi-directional power converter; and

a second switch operable to selectively electrically reverse a polarity of a coupling of the DC device to the set of DC terminals.

2. (Canceled)

3. (Currently Amended) The power system of claim 1, further comprising:

a capacitor;

an inductor;

a diode, wherein the capacitor, the inductor and the diode are electrically coupled with at least one switch of at least one of the bridge legs to form a boosting circuit; and

~~a second switch operable to selectively electrically couple and uncouple the boosting circuit between the set of DC terminals of the bi-directional power converter and the DC device.~~

4. (Currently Amended) The power system of claim 1 wherein the first switch is further operable to uncouple the primary AC device from the set of AC terminals of the bi-directional power converter when the secondary AC device is coupled to the set of AC terminals of the bi-directional power converter and to couple the primary AC ~~primary~~ device to the set of AC terminals of the bi-directional power converter when the secondary AC device is uncoupled from the set of AC terminals of the bi-directional power converter.

5. (Original) The power system of claim 1 wherein the first switch is a multi-positional switch operable to uncouple the primary AC device from the set of AC terminals of the bi-directional power converter when the secondary AC device is coupled to the set of AC terminals of the bi-directional power converter and to couple the primary AC device to the set of AC terminals of the bi-directional power converter when the secondary AC device is uncoupled from the set of AC terminals of the bi-directional power converter.

6. (Original) The power system of claim 1 wherein the first switch is a multi-positional relay operable to uncouple the primary AC device from the set of AC terminals of the bi-directional power converter when the secondary AC device is coupled to the set of AC terminals of the bi-directional power converter and to couple the primary AC device to the set of AC terminals of the bi-directional power converter when the secondary AC device is uncoupled from the set of AC terminals of the bi-directional power converter.

7. (Original) The power system of claim 1 wherein the first switch comprises at least a first switch element and a second switch element, the first switch element operable to couple and uncouple a first pole of the secondary AC device from a first pole of the set of AC terminals and the second switch element operable to couple and uncouple a second pole of the secondary AC device to a second pole of the set of AC terminals.

8. (Currently Amended) The power system of claim 1 wherein the first switch is further operable to ~~the~~ operate the primary AC device at low power level when the secondary AC device is coupled to the set of AC terminals of the bi-directional power converter.

9. (Original) The power system of claim 1 wherein the first switch is further operable to cause a physical load driven by the primary AC device to be uncoupled from the primary AC device when the secondary AC device is electrically coupled to the set of AC terminals of the bi-directional power converter and to cause the physical load driven by the primary AC device to be coupled to the primary AC device when the secondary AC device is electrically uncoupled to the set of AC terminals of the bi-directional power converter.

10. (Original) The power system of claim 1 wherein each of the bridge legs comprises a number of integrated bipolar junction transistors and a number of free-wheeling diodes electrically coupled across respective ones of the integrated bipolar junction transistors.

11. (Original) The power system of claim 1 wherein each of the bridge legs comprises a number of metal-oxide semiconductor field effect transistors and a number of free-wheeling diodes electrically coupled across respective ones of the metal-oxide semiconductor field effect transistors.

12. (Original) The power system of claim 1, further comprising:  
at least one of the primary AC device; and the secondary AC device.

13-23. (Canceled)

24. (Currently Amended) A method of operating a power system, the power system comprising a first switch, a second switch, and a bi-directional power converter, the bi-directional power converter comprising a set of AC terminals, a set of DC terminals and a

number of switching components electrically couplable between the set of AC terminals and the set of DC terminals, the method comprising:

operating the first switch to at least one of: electrically couple a secondary AC device to the set of AC terminals of the bi-directional power converter and electrically uncouple the secondary AC device from the set of AC terminals of the bi-directional power converter; and

operating the bi-directional power converter to at least one of: rectify a current when the current is flowing from the set of AC terminals to the set of DC terminals of the bi-directional power converter and invert the current when the current is flowing from the set of DC terminals to the set of AC terminals of the bi-directional power converter; and

operating the second switch to selectively electrically reverse a polarity of a coupling of a DC device to the set of DC terminals.

25. (Currently Amended) The method of claim 24 wherein operating the first switch to electrically couple the secondary AC device to the set of AC terminals of the bi-directional power converter further electrically uncouples a primary AC device from the ~~first~~ set of AC terminals of the bi-directional power converter.

26. (Currently Amended) The method of claim 24 wherein operating the first switch to electrically uncouple the secondary AC device from the set of AC terminals of the bi-directional power converter further electrically couples a primary AC device to the ~~first~~ set of AC terminals of the bi-directional power converter.

27. (Original) The method of claim 24 wherein operating the first switch to electrically uncouple the secondary AC device from the set of AC terminals of the bi-directional power converter further causes a physical load driven by a primary AC device to be uncoupled from the primary AC device when the secondary AC device is electrically coupled to the set of AC terminals of the bi-directional power converter and causes the physical load driven by the primary AC device to be coupled to the primary AC device when the secondary AC device is electrically uncoupled to the set of AC terminals of the bi-directional power converter.

28. (Canceled)

29. (Currently Amended) The method of claim 24 wherein the power system further comprises a boosting circuit and ~~a second switch, the method further comprising wherein~~ operating the second switch includes:

~~operating the second switch to selectively electrically couple and uncouple coupling and uncoupling~~ the boosting circuit between the set of DC terminals of the bi-directional power converter and a DC device coupled to the set of DC terminals.

30. (Currently Amended) The method of claim 24 wherein operating the power system further comprises a second switch, the method further comprising includes:

~~operating the second switch to selectively electrically couple~~ coupling a DC device to the set of DC terminals of the bi-directional power converter.

31. (Currently Amended) The method of claim 24 wherein operating the power system further comprises a second switch, the method further comprising includes:

~~operating the second switch to selectively electrically couple~~ coupling one of at least two DC devices to the set of DC terminals of the bi-directional power converter.

32. (Original) The method of claim 24 further comprising:

applying a set of control signals to at least some of the switching components to operate the bi-directional power converter in a boost mode.

33. (Original) The method of claim 24 further comprising:

applying a set of control signals to at least some of the switching components to operate the bi-directional power converter in a buck-boost mode.

34-46. (Canceled)